NASA Joint Sponsored Research Program

Preliminary Report

Use of Space Act Authority to
Develop Joint Sponsored Research Projects (88 - 93)

Presented to
NASA Office of Advanced Concepts & Technology - Code CU

Program Implemented by
American Technology Initiative, Inc.

Additional JSR Program Reports Will Be Presented No Later Than June 30, 1994 Regarding ...

- Design of comprehensive JSR Program ... per NASA/AmTech MOA of 6/15/92
- Role and performance of third party, nonprofit as facilitator ... cooperative agreement NCC2-648 of May 15, 1992

OUTLINE

- Background
- Objectives of JSR Program Project Efforts
- Results and Findings
- Conclusions
- Recommendations
- Appendices
  - JSR Program Project Status Report: October, 1993

Chronology of Delegation of Authority

- 1984-1987: Researched mechanisms for conducting R&D collaborations using funded Space Act Agreement
  Project: NASA - Hastings Research Project
- 1987-1989: Prototype project explored and implemented to demonstrate feasibility of mechanism
  Project: SFSU - Joint Enterprise Program
- 1989: Senior NASA management briefed on results; delegation of authority requested; new program formed to implement next phase of development (JSR Program);
  Project: NASA JSR Program Implementation: AmTech formed 10/1/89
- 1990: Conditional authority provided to negotiate 2-3 JSR projects
- 1991: JSR Program results reported; conditional authority expanded to 4 structured projects and 10 prospects approved for conversion to agreements
- 1992 - Present: Letter delegation of authority signed; JSR Program objective to fully test program potential per delegation of authority and MOA, and report on technology transfer research findings

See Tab Q - Delegation of Authority

See Tab R - MOA

The JSR Program Evolved a Limited Set of Objectives Regarding JSR Project Activity

- Process ... Develop a process that works within NASA and for private sector
- Legal Agreement Instrument ... Develop a model JSR legal agreement that can be customized to prospective NASA/industry partner needs
- Pilot Projects ... Form projects to test process and levels of demand
- Results ... Measure results of efforts to apply process and form projects
- Conclusions ... Draw conclusions about what does and does not work ...

The Process of Forming R&D Collaborations Evolved Through Three Phases to Include Eight Steps ... Each with Distinct Value Added

- Outreach/Inreach ... Technology transfer and JSR Program briefings
- Intake/Referrals ... Gathering and analysis of information on 14 features to determine potential for R&D collaboration
- Technology Transfer Consulting ... Advice on options to use one of NASA's 16 programs or technology transfer agreements
- Referred to Non-JSR Programs ... Preparation of information and liaison to refer intake to non-JSR programs for technology transfer
- Selected and Prepared for JSR Project ... Preparation of information and processing to negotiate JSR Agreement
- Screened/Suspended ... Negotiations result in no agreement due to disagreement on specific terms or conflict with broader, non-JSR policy issues
- Signed ... Agreement successfully negotiated and signed
- Converted to Non-JSR Collaborations ... Non-JSR collaboration formed from either referrals to other programs or partially successful JSR negotiations

The Following "Measures" of Effectiveness Were Monitored in this Order of Priority ...

Metric	Description
• Number of Projects Processed	Total number of projects at each step
• Financial Leverage	Ratio of resources contributed
• Range of NASA and Industry Served	Breadth of involvement
• Commercial Applications	Type and range of commercial use
• Patents/Licenses/Copyrights	Number and use of inventions
• Improvement in NASA Mission R&D	Benefits to NASA mission managers
• Enhance U.S. Competitiveness	Benefits to U.S. industry
• Other Technology Transfer Programs Supported	Range of the programs supported

The JSR Legal Agreement for Negotiating Partnerships with Industry was Based on Legal Research Outputs ...

- Based on range of funded Space Act Agreement authority
- Adjusted to reflect statutory intent and requirements of all technology transfer legislation
- Incorporated relevant portions of applicable commercial code
- Included review of case law and case results from examples in the private sector and other federal agencies

The Program Has Generated 164 Inquiries for JSR Projects, Producing Fourteen R&D Collaborations

Steps	1988 - 90	1991	1992	1993 (9 mos)	
• Outreach/Inreach Presentations	N/A	24	37	21	
• Intake	64	35	28	37	
• Technology Transfer Analyzed	64	32	28	32	
• Referrals	2	12	16	19	
• Selected as JSR	14	14	11	13	
• Screened/ Suspended	9	12	8	9	
• Signed	2	0	1	1	= 14 (1)
• Converted	3	2	2	3	

(1) see appendices

The Program has Generated $2.3 Million in Cash and In-Kind Resources for the Federal Government

	1988 - 1993 (9 mos)	
	Federal	Non-federal
Signed JSRs		
- cash	$1,226.9	$1,173.3
- in-kind ($ equivalent)	5.0	243.2
Conversions: implemented through other transfer mechanisms		
- cash	1,395.0	1,139.0
- in-kind ($ equivalent)	- 0 -	- 0 -
TOTALS	$2,621.9	$2,312.3

The Program Has Found Demand for Its Features Across Most of NASA Centers and Selected Industrial Segments

	FEDERAL GOVERNMENT										STATE GOV'TS			INDUSTRY BY SIC CODE					
	NASA						OTHER												
	ARC	LaRc	LeRc	JSC	JPL	GSFC	DOD	DOE	FAA		Agriculture	Mining	Construction	Manufacturing	Transp & Utils	Wholesale	Retail	Finance	Services
Intake	√	√	√	√	√	√					√			√	√				√
Signed Projects																			
JSR 1	√													√					
JSR 4	√	√	√				√		√	√				√					√
JSR 6	√	√					√							√					
JSR 7	√			√										√	√				
Conversions																			
JSR 2	√													√					√
JSR 3	√						√							√					
JSR 5	√													√					
8910	√										√								
9102	√																		√
9202	√																		√
9206	√													√					
9302	√	√	√					√						√	√				√
9303	√										√								√
9319	√			√															√

Range Of Performance By Project Across Remaining Metrics

	Commercial Applications	Patent Licenses Copyrights	Improvements in NASA Mission R&D	Enhancement to U.S. Competitiveness	Other Tech Trans Programs Supported
Signed Projects					
JSR 1	√	√	√	√	
JSR 4	√	√	√	√	
JSR 6	√	√	√	√	
JSR 7	√		√		
Conversions					
JSR 2	√	√		√	
JSR 3	√		√		√
JSR 5	√	√	√	√	
8910	√	√	√		√
9102	√		√	√	
9202	√		√	√	
9206	√	√	√		
9302	√	√	√	√	
9303	√		√	√	√
9319	√		√	√	√

Project	Technology	Patents/Licenses/Copyrights
JSR #1	Mass Spectrometer	5 patents and copyrights; 3 exclusive licenses issued to commercial participant
JSR #4	Aircraft Design Software	4 of 5 releases (4.0) completed; 8 commercial licenses issued
JSR#5	Aircraft SurfaceTem-perature Measurement	1 patent disclosure; non-exclusive licenses issued to commercial participant
JSR #6	Aircraft Surface Air Pressure Measurement	1 patent; 2 additional discoveries eligible for patent or copyright; non-exclusive license issued to commercial participant
JSR #7	Rehydration Fluids	4 formulations in testing and eligible for protection as patent
10 Other Projects	Various	Wide range of hardware and software projects with potential for 6 new inventions eligible for protection

Project	Technology	Commercial Applications
JSR #1	Mass Spectrometer	Improved existing mass spectrometer product - advanced AI improved interpretation; miniaturized features expanded range of markets; adopted after 18 months of development
JSR #2	Calcium Sensor	Spin-off company - project team formed spin-off company funded by Tecknekron
JSR #4	Aircraft Design Software	Software for aircraft adopted - development of first national standard for aircraft design software; adopted completely by Boeing after 24 months of development
JSR #6	Aircraft Surface Air Pressure Measurement	Breakthrough technology - development and successful test of new method of air pressure measurement ... eliminates pressure taps ... provides comprehensive pressure maps ... applied to Boeing 777 design program
9202	Helicopter Safety	Flight planning tool - development of emergency medical helicopter flight planning tool ... immediate test by major commercial user
7 Other Projects	Various	Product and process improvement in 8 product/service categories

Project	Technology	Improvement in NASA Mission R&D
JSR #1	Mass Spectrometer	Shortened project from 5 to 2 years and provided spin-in of critical software to NASA
JSR #4	Aircraft Design Software	Mechanism permitted pooling of previously proprietary software code creating potential national standard
JSR #7	Rehydration Fluids	Shortened to one year testing rehydration drink for astronauts; astronaut corps has adopted one version of drink; commercial participant paid all costs of testing and is supplying all drinks to NASA astronauts gratis in return for ground based tests
9206	Water Purification	Spin-in to NASA of proprietary software for modification specifically to NASA needs for life support system analysis
9202	Helicopter Safety	Corporation providing free testing and staff/engineering to enhance modification of flight risk control mechanism
5 Projects	Various	Advances in rate of R&D; scope of work; or speed of testing due to partnership

RESULTS - ENHANCED COMPETITIVENESS

Project	Technology	Enhanced Commercial Competitiveness
JSR #4	Aircraft Design Software	Applied as process to Boeing 777 and McDonnell Douglas aircraft; prepared as product for spin-off company in 1996
JSR #5	Aircraft Surface Temperature Measurement	Applied within 1 year to Boeing 777 design test
JSR #6	Aircraft Surface Air Pressure Measurement	Applied to Boeing product line for aircraft design; Boeing qualitative estimate of $ 10+ million savings in aircraft development process; cancelled Japanese access and exclusive license to open up for potential U.S. consortium
9302	TRACON Software	Long term development plan intends to export software to international market
9303	Remote Phylloxera Sensing	Pilot project for development of turnkey industry and cost savings for wine companies
9319	Telemedicine	Intended to lower distribution cost of specialized medicine to rural areas

RESULTS - SUPPORT OTHER TECHNOLOGY TRANSFER

- **NASA**

  Technology Transfer Programs

  - RTTC Pilot Project - Codevelop Joint Sponsored Demonstration Agreement
  - RTI/AEP Pilot Project - Develop method to jointly pursue R&D collaborations

  Special Projects

  - Incubator Research ... Support to NASA HQ and contractor (IC^2 Institute) on reviewing incubator options at NASA
  - VideoTechnology Transfer ... Support to NASA Headquarters and contractor for project
  - Regional Economic Development ... Participant in two regional development projects: Silicon Valley and Rocky Mountain - Wyoming
  - Special NASA Project Teams ... Research support for national benefit and technology transfer teams

  Research Programs

  - Space Technology Transfer Workshop - Design and conduct, comprehensive technology transfer workshop for ITP (1992)
  - Space Station - Design and test implementation of method for transferring large portions of advanced R&D
  - ARC Life Support - Audit of all technology transfer over a 3-year period

- **Other Federal**

  TRP - 3 proposals initiated and submitted

  ARPA/HPCCP - Starting 2nd year of 3-year project to form "technology pull" consortia for commercial HPCC technology

CONCLUSIONS

- Generates Multiple Benefits ... multi - party collaborations generate financial, R&D and competitiveness benefits
- Requires Multi-step Process ... the benefits are created by executing a variety of value added steps leading to Joint Sponsored Research Agreements
- Requires Facilitated Process ... the generation of the benefits requires an active structuring and negotiating process led by value adding facilitators
- Needs Development of Interdisciplinary Team ... the active structuring and negotiating process requires single team of R&D, legal, financial and process experts
- Reflects Higher Volume Potential ... the volume of results adheres to the level of authorization provided during the pilot test period ... the full potential will require a higher level and formalization of the program authorities
- Reveals Needs of Industry ... strongest need is for special purpose 501(c)(3) in collaborations; also demand for bilateral (NASA - one company) structure; limited demand for trilateral arrangement (NASA - company - academia) with academia as core R&D producer

Secure Permanent Use of the JSR Program and Disseminate Throughout NASA

- Extend Current Authorities
- Formalize Program
- Update Program Implementation Agreement
- Establish NASA-wide Implementation
- Establish JSR Program Metrics

Extend Current Authority and Delegate

- Extend for three years
- For projects above $750K of NASA resources per annum ... delegate to all AA's - with General Counsel concurrence
- For projects below $750K of NASA resources per ... delegate to Center Directors - with field center Chief Counsel concurrence

Establish Formal, HQ Based, Joint Sponsored Research Program ...

- Adopt draft model JSR Agreement language
- Adopt draft JSR Program guidelines
- Adopt draft JSR Project development and review process ... quality standards
- Establish a formal, HQ program management and review

Update the Current Cooperative Agreement for Program Implementation ...

- Review and modify NASA - AmTech MOA and cooperative agreement for program implementation
- Modify agreement consistent with expanded program

Undertake NASA-Wide Implementation

- Designate JSR Program personnel at each Center
- Assign selected civil service personnel via Intergovernmental Personnel Act (IPA) to AmTech for training

Establish Major Metrics

- Develop and adopt major performance metrics for the next stage

Appendix

NASA Joint Sponsored Research Program

Project Status Report

October 1993

Prepared by
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For internal NASA use only

Submitted in partial fulfillment of Grant no. NCC2-648 and the Agreement between NASA and AmTech for implementation of the JSR Program.

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AmTech JSR Project Status Summary

I. Project Results

II. Current Project Development

Other AmTech Activities

For internal NASA use only

Submitted in partial fulfillment of Grant no. NCC2-648 and the Agreement between NASA and AmTech for implementation of the JSR Program.

American Technology Initiative

THE MISSION

American Technology Initiative, Inc. (AmTech) is the first and only nonprofit corporation entirely dedicated to promoting technology transfer and facilitating R&D partnerships between the public, nonprofit and private sectors using the joint venture mechanism. From its inception, AmTech has pioneered the development of innovative mechanisms for pooling public and private resources to ensure the transfer and commercialization of publicly funded technology. AmTech is directed by a nationally recognized Board of Trustees from government, academia and industry with experience in business and technology issues. In accordance with AmTech's charter, all surplus income is reinvested to support new technology transfer and commercialization mechanisms, fellowships, and research in areas of technology critical to national needs and American economic competitiveness.

NASA Joint Sponsored Research Program

SCOPE

The NASA Joint Sponsored Research (JSR) Program is intended to: 1) foster the synergistic collaboration of NASA and the private sector in joint sponsored research in order to achieve R&D efficiencies through leveraging of NASA's R&D resources in aeronautical and space science and technology and their applications; and 2) accelerate technology transfer and commercialization.

NASA Joint Sponsored Research Program

REPORTING DEFINITIONS

1. R&D project complete - the project has been completed and the final reports delivered.

2. R&D in progress - the project research currently is underway.

3. In negotiation - the preliminary terms and conditions have been proposed by one of the potential participants, and negotiations are under way on those terms and conditions.

4. In preparation- the preliminary terms and conditions of an offer are being prepared by AmTech for possible negotiations.

5. Prospects - a potential project has been referred to AmTech and meets AmTech's minimum criteria. Additional information is being gathered to determine if it meets all criteria.

6. Rejected - the prospect has been reviewed and rejected, or the preparation and/or negotiations have failed.

7. Resource contributions - the total cash and in-kind resources committed by the parties to the completion of research over the anticipated life of the project.

8. In-kind resources - the estimated value of in-kind resources committed by the terms of the project agreement, and valued at cost.

9. Estimated resource contributions - the estimated resource contributions necessary from each participant to complete the research, according to the preliminary R&D plan submitted by the project applicant.

AmTech JSR Program Criteria

Projects In Preparation

Those projects which have been screened by AmTech and meet the following minimum criteria for investment of resources for development of a project:

- Project: A discrete project with a clear title, line of authority, and management review
- Funding: NASA funding is currently in place, and planned for at least two years
- Importance of Research: The research objectives are important to NASA; they clearly fulfill a mandated mission or program objective
- Nonprofit Role: There is currently a nonprofit institution involved, or the PI is prepared to delegate a portion of work to a nonprofit
- Management Support: The project is endorsed by NASA HQ managers
- PI Support: The PI supports the proposed JSR project effort
- Cooperative Research: The NASA referral manager believes there is strong interest in industry collaborative research
- Intellectual Property/No Tech Transfer Blocks: The IP is sufficiently clear to determine that there are no major blocks to transfer of existing or potential intellectual property

AmTech JSR Program Criteria

PROSPECTS

Those candidate projects originated by AmTech from NASA managers and industry representatives. Inclusion on the review list means that the following verbal representations have been made to AmTech:

- The candidate project is NASA funded
- There is a current or potential nonprofit research role
- There has been some form of industry interest in the technology
- The referring manager is committed to using the AmTech tech transfer vehicle in lieu of other tech transfer mechanisms

AmTech JSRA Project Status Summary

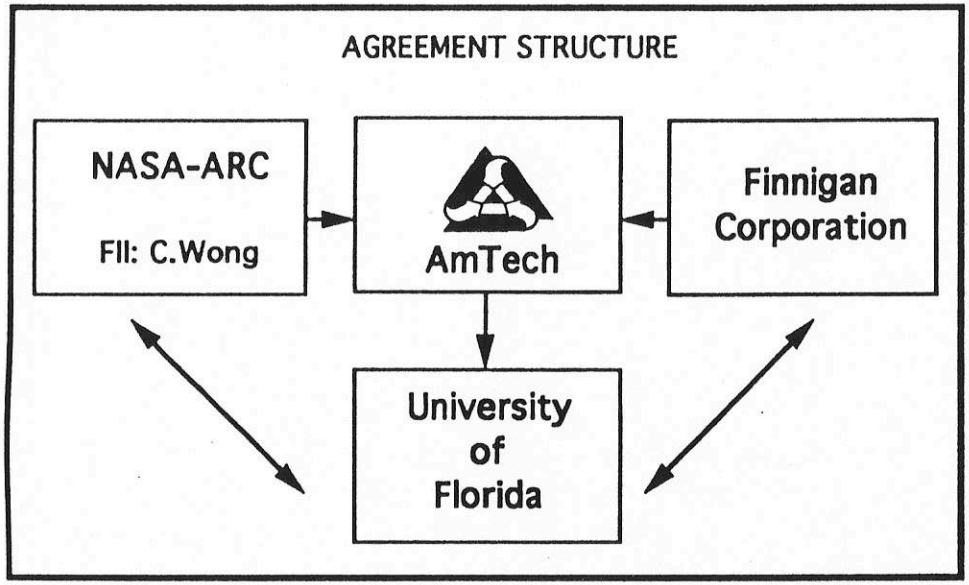
I. Project Results

Category/Project	# of Commercial Applications	Resource Contributions ($K)			
		Cash		In-Kind	
		Fed	Non-fed	Fed	Non-fed
A. R&D Project Complete					
1. 8801-JSRA #1 (Mass Spec.)	1	359.2	269.5		
B. R&D in Progress					
1. 8901-JSRA #4 (ACSYNT)	1	405.0	684.5		
2. 9301-JSRA #6 (Paints)	2	462.7	165.0		221.0
3. 9211-JSRA #7 (Astro-ade)	1		54.3	5.0	22.2
Subtotal		1,226.9	1,173.3	5.0	243.2
*(*Resource contributions to date)*					
C. JSR R&D Collaboration Conversions (Documented)					
1. 9206 (Water Purification)	1	135.0			
2. 9202 (SAFE Helicopters)	1	75.0			
3. 9102 (Auto. Feedback Trng)	1	125.0	75.0		
4. 9101-JSRA #5 (Video Lumin. Barometry)	1	40.0	60.0		
5. 8910 (Crop Growth Res.)	1				
6. 8903-JSRA#3 (ADCACS)	1	550.0	904.0		
7. 8902-JSRA #2 (Chem. Sensor)	1				
8. 9319 (Telemedicine)					
D. R&D Collaboration (Tech. Assistance)					
1. 9303 (Remote Sensing/Phyllexora)	1	200.0	100.0		
2. 9302 (TRACON Software)	1	270.0			
Total		2,621.9	2,312.3	5.0	243.2

JSR Project Results

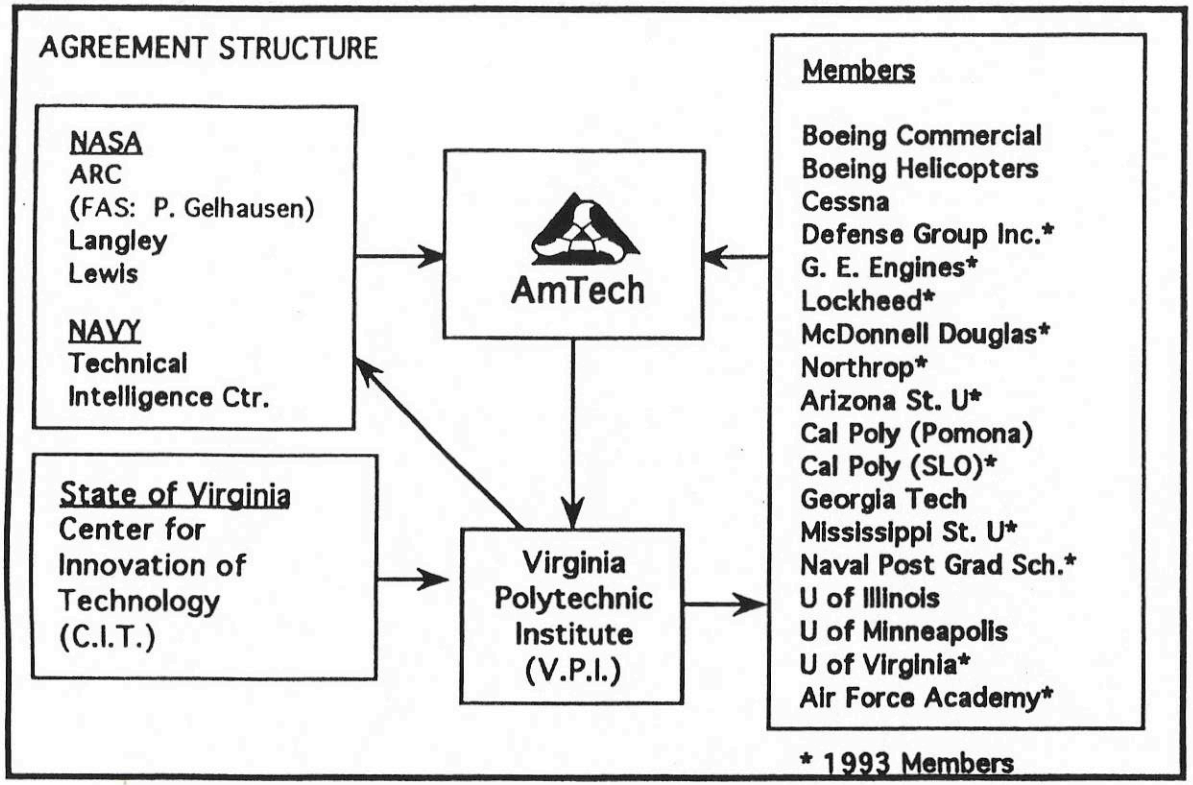
Technology Areas / Field Installation	Ames Research Center	Langley	Lewis
AERONAUTICS RESEARCH AND TECHNOLOGY BASE			
Aerodynamics R&T	JSRA5, JSRA6	JSRA6	
Propulsion & Power R&T			
Materials & Structures R&T			
Controls, Guidance & Human Factors R&T			
Flight Systems R&T	JSRA3		
Systems Analysis	JSRA4, 9302	JSRA4	JSRA4
AERONAUTICS SYSTEMS TECHNOLOGY PROGRAMS			
High-Performance Computing/Numerical Aerodynamic Simulation			
Materials & Structures Systems Technology			
Rotorcraft Systems Technology	9202		
High-Performance Aircraft Systems Technology			
High-Speed Research			
Advanced Subsonic Technology			
SPACE RESEARCH & TECHNOLOGY BASE			
Aerothermodynamics R&T			
Space Energy Conversion R&T			
Materials & Structures R&T			
Systems Analysis			
Space Automation & Telerobotics			
Information & Controls R&T	JSRA1		
Human Support R&T	8910, 9206, JSRA3, JSRA7		
Space Communications R&T			
SPACE SCIENCES			
Planetary Science			
Life Science	9102, 9303, 9313		
Space Physics			
Atmospheric Sciences			

"Mass Spectrometer Based Intelligent Systems Manager"



RESOURCE CONTRIBUTIONS	Cash	In-kind
NASA	$359,163	Consultation; Expert system software
University of Florida	$94,500	Professor and graduate student time, labs
Finnigan	$175,000	Consultation, labs, equipment, background patent use

	ROLE	INTELLECTUAL PROPERTY RIGHTS	MISSION/COMMERCIAL APPLICATION
NASA	Consultation; develop expert system software.	Government license to inventions and software, including company background inventions.	Demonstrate feasibility of MS/MS mass spectrometer for Space Station use.
University of Florida	Extend capabilities of ion trap mass spectrometer and miniaturize mass spectrometer.	Receive title to University of Florida inventions.	Royalty income from licensing inventions.
Finnigan Corporation	Consultation; extend AI/ expert system approaches to instument control.	Access to all data developed; first option to exclusive license on inventions by University of Florida.	Introduce product improvement & new product based on miniaturization & enhancement of mass spectrometer, stemming from 5 inventions made during JSR project.



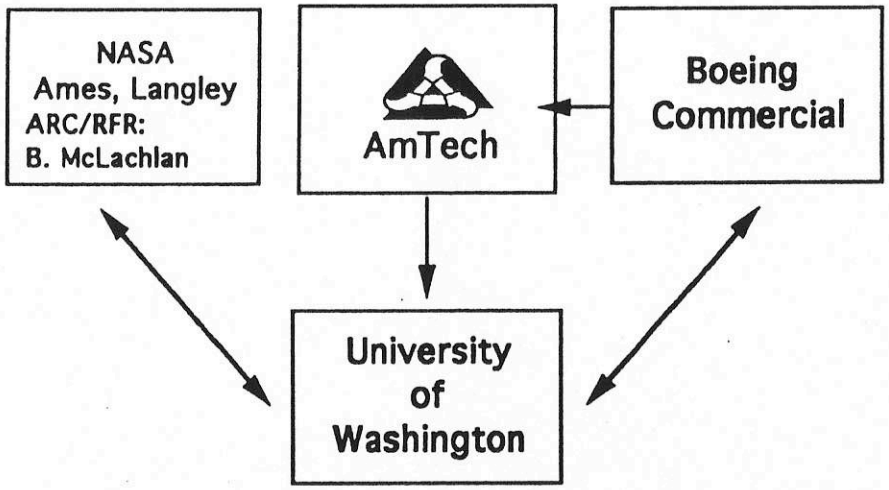
"The ACSYNT Institute"

RESOURCE CONTRIBUTIONS (to date)	Cash	In-kind
NASA/Navy	$ 405K	Two (2) full-time programmer/analysts
V.P.I. C.I.T.	$ 84K $ 47K	One year professor & graduate students' time; labs & equipment
Members	$ 553.5K	Company developed codes

	ROLE	INTELLECTUAL PROPERTY RIGHTS	MISSION/COMMERCIAL APPLICATION
NASA	Develop portions of analysis code and co-direct research and software development.	Government license to ACSYNT software (including software generated by VPI & contributed by members).	Develop software for NASA aeronautics missions, High Speed Research Program (HSRP) and High Performance Aircraft.
Virginia Polytechnic Institute (V.P.I.)	Research aircraft design problems; develop software; develop user-friendly version of ACSYNT; support members' ACSYNT use.	Own copyright to ACSYNT software.	ACSYNT Institute based at VPI. Spin-off company to perform maintenance & support of ACSYNT software.
Consortium Members	Provide user feedback; optionally, develop and contribute code to ACSYNT Institute.	License for inhouse use of software.	ACSYNT is becoming companies' predominant software tool for aircraft design, and emerging as industry standard.

Video Luminescent Barometry ("Paints")

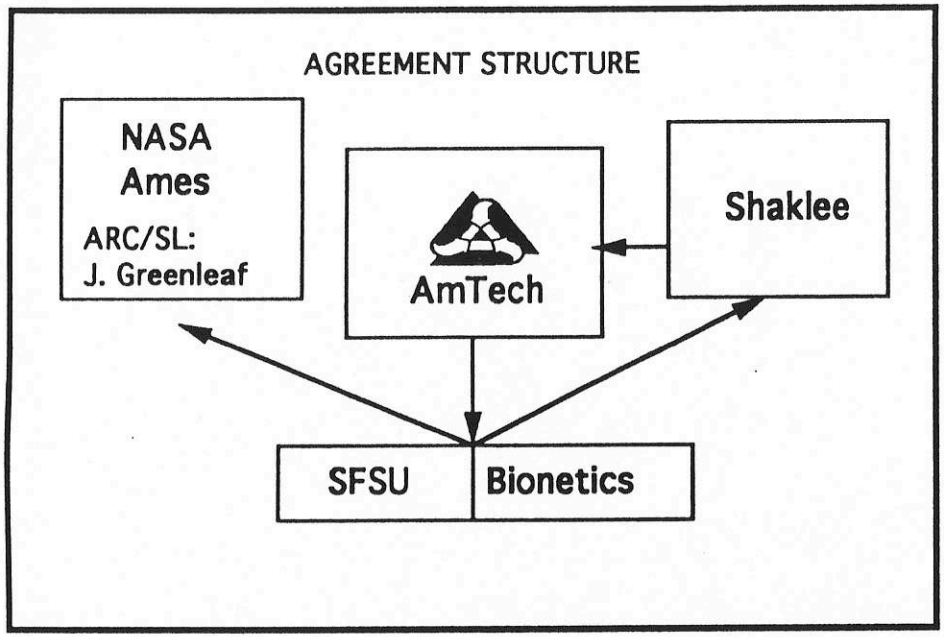
AGREEMENT STRUCTURE



RESOURCE CONTRIBUTIONS	Cash	In-kind
NASA	$462,700	2 full time researchers/ analysts; yearly test in large tunnel; 16 pieces of equipment loaned to UW
University of Washington		$143,200 overhead reduction $77,800 for 1 graduate student and 4 months professor salary
Boeing	$165,000	1 full time research/analyst 1 yearly test in transonic tunnel

	ROLE	INTELLECTUAL PROPERTY RIGHTS	MISSION/COMMERCIAL APPLICATION
NASA	Small scale sensor test Large scale sensor test Software development Protocol development	Fully paid, government use license Royalty/fee reimbursement for commercial test use	Government - data generation for government aircraft development Commercial - service for reimbursable wind tunnel use
University of Washington	Basic chemistry research Sensor development Sensor bench test Project management	Patent holder for sensor Licensor of sensor for usage fees	Investigating market demand for separate spin off company to support product
Boeing	Large scale test Comparison w/alternative systems	Fully paid, unlimited commercial use license	Generate pressure & temperature data for aircraft development Reduce by 80% use of pressure tops

High Capacity Fluids ("Astro - ade")



RESOURCE CONTRIBUTIONS	Cash	In-kind
NASA		$5K/per annum supplies 50% researcher per annum Lab facilities
Bionetics SFSU		$22.2K overhead reduction; 3 months per annum professor salary
Shaklee	$ 54,255	25% researcher time Sample production

	ROLE	INTELLECTUAL PROPERTY RIGHTS	MISSION/COMMERCIAL APPLICATION
NASA	Protocol conditions Project management Report preparation	Unlimited government use of test data Patent of NASA formulation	Enhanced rehydration fluids for astronaut re-entry
Bionetics SFSU	Recruit subjects Execute tests Provide raw data to NASA/Shaklee	No IP rights	Publications for SFSU researchers
Shaklee	Provide 3 comparative drink formulations	Option for exclusive commercial license of NASA formulation	Modification, enhancement of commercially marketed fitness drinks

II. Current Project Development

Category/Project	# of Commercial Applications	Estimated Resource Contributions ($K)			
		Cash		In-Kind	
		Fed	Non-fed	Fed	Non-fed
A. In Negotiation					
1. 9309 (Biofilms)	1	50.0	45.0	200.0	100.0
2. 9211 (Astro-ade II)	1	55.0	55.0		
B. In Preparation					
1. 9210 (Robots)	1				
2. 9317 (DAS Interferometer)					
3. 9305 (CO2/Multigas Sensor)		40.0			
4. 9324 (Liquid Cooled Garment)					
5. 9311 (VPCAR Water Purification)		40.0			
6. 9333 (Gen. Aviation Tech. Consortium)		63,000.0			
7. 9334 (Rotor Consortia)		60,000.0	60,000.0		
C. Prospects					
1. 9315 (Super Critical H2O)		60.0			
2. 9328 (Computer Optical Switches)					
3. 9329 (Standard Grid Generator)					
4. 9330 (Mag Lev Trains)					
5. 9310 (H2O Purificaion-Vapor Compressor)		30.0			
6. 9316 (Air Purification)					
7. 9306 (Rotor Stater Code)		80.0			
8. 9335 (UAV Consortium)		110,000.0			

(Continued)

II. Current Project Development

Category/Project	# of Commercial Applications	Estimated Resource Contributions ($K)			
		Cash		In-Kind	
		Fed	Non-fed	Fed	Non-fed
9. 9301 (Aircraft Life Support)					
10. 9336 (Variable Thermal Insulation)					
11. 9204 (MEDSAT/Remote Sensing-Lyme Control)		75.0			
Total		233,430.0	60,100.0	200.0	100.0

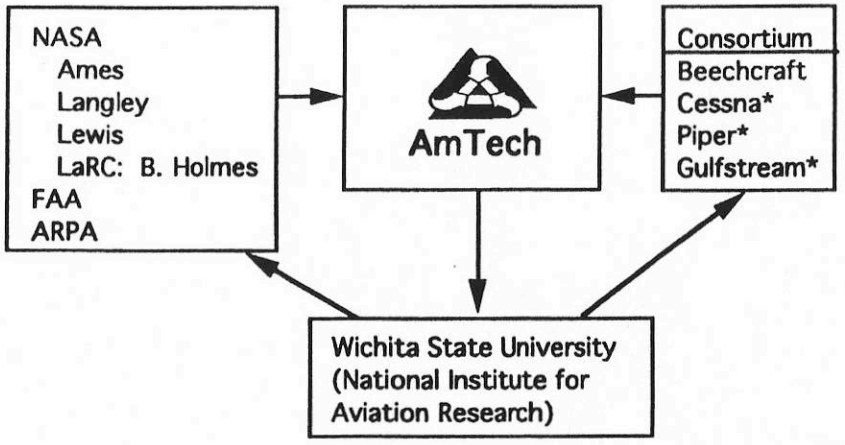
JSR Project Development

Technology Areas	Field Installation	ARC	GSFC	JSC	KSC	Langley	Lewis	Marshall	JPL	SSC
AERONAUTICS RESEARCH AND TECHNOLOGY BASE		9301 9307 9333				9333	9333			
AERONAUTICS SYSTEMS TECHNOLOGY PROGRAMS		9306 9328 9329 9330 9334 9335				9334 9335	9334			
SPACE RESEARCH & TECHNOLOGY BASE		9204 9309 9315 9317 9324 9336							9210	
SPACE SCIENCES		9211 9304 9305 9310 9311 9316								

10/93

General Aviation Technology Consortium

AGREEMENT STRUCTURE
(under development)



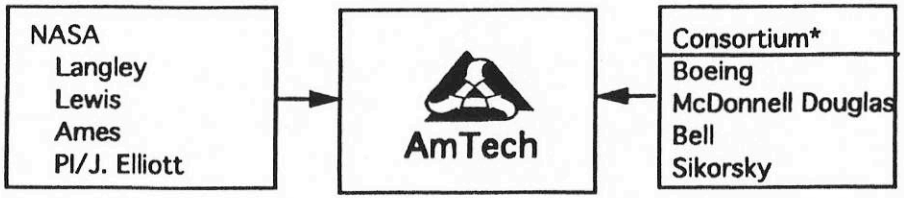
* Participation not confirmed

RESOURCE CONTRIBUTIONS (estimated)	Cash		In-kind
NASA/FAA	$1.2M FY 94 $3.5M FY 95 (Funding anticipated thru FY 99)	+	background technology, facilities, equipment, technical leadership
University	TBD	+	site of consortium organization
Industry Consortium	TBD		

	ROLE	MISSION/COMMERCIAL APPLICATION
NASA	Provide background technology Project management	Integration of flight cockpit technology; Icing protection systems; integrated design and manufacturing, crash worthiness Establish design guidelines, system standards and bases and methods for certification of interest to all parties
University	Provide consortium organizational elements	
Industry Consortium	Provide beta testing of technology	

Rotorcraft Technology Consortium

AGREEMENT STRUCTURE
(under development)



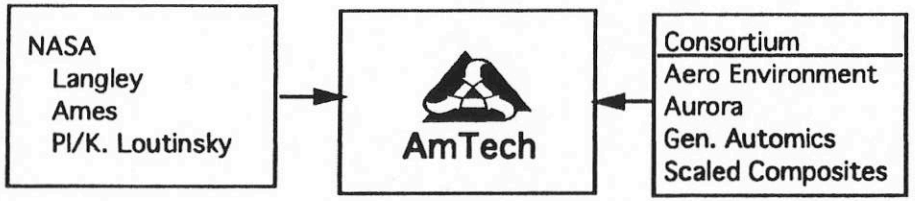
* tentative membership

RESOURCE CONTRIBUTIONS (estimated)	Cash	In-kind
NASA	$60 million	
Consortia Organization		
Industry Consortium	$60 Million	

	ROLE	MISSION/COMMERCIAL APPLICATION
NASA	Initiating user group development Providing funding for specific projects Providing critical facilities for projects	Research designed to increase the competitiveness of the U.S. helicopter industry
Consortia Org.	Acting as organizational structure for industry consortia Decisionmaking body for project selection	
Industry Consortium	Designate critical projects for U.S. competitiveness Undertake R&D projects for consortia	

Unmanned Aerial Vehicle Technology Consortium

AGREEMENT STRUCTURE (under development)



RESOURCE CONTRIBUTIONS (estimated)

	Cash	In-kind
NASA	$22M/yr for 5 yrs +	Background technology payload space
Consortium		Background technologies, personnel, facilities, flight experiments

	ROLE	MISSION/COMMERCIAL APPLICATION
NASA	Stimulate fledgling UAV airframe industry by providing support for resolution of key technical problems and demo of high altitude, long duration platform	Platform for high altitude research; mission demonstrations
Consortium	Technology development addressing, inter alia • Propulsion systems • Systems analysis • Materials and structures • Aerodynamics • Sensors	Integration of technical solutions into UAV's under development by companies Market applications TBD

OTHER AMTECH ACTIVITIES*

- **The HPCC Program**
  - Implementing 2 Pilot Projects
    - multi physic simulation
    - LISP extension in MPP
  - Project Development Process Unique to HPCC Program

- **TRP opportunities**
  - AmTech participated in 3 proposals, outcome is pending
    - GPS helicopter navigation
    - ACSYNT Commercialization
    - Video luminescent paints

- **Pursuing other opportunities with**
  - Lawrence Berkeley National Laboratory
  - DOE/Hanford Nuclear Facility

- **Anticipate hiring additional associate (project management) and expansion of office space**

* provided as a courtesy to NASA JSR Program management

ORGANIZATION

Trustees & Senior Advisors

Dr. Paul J. Coleman, Jr. *Trustee*	University of Calfornia Los Angeles, CA
Mr. Paul G. Dembling, Esq. *Trustee*	Schnader, Harrison, Segal & Lewis Washington, DC
Mr. John Egan *Trustee*	The Egan Group Washington, DC
Dr. Roger Heyns *Honorary Trustee & Senior Advisor*	William & Flora Hewlett Foundation (Retired) Menlo Park, CA
Dr. Richard G. Johnson *Trustee & Chairman of the Board*	Aspen Global Change Institute Aspen, CO
Mr. Ray Kline *Trustee*	Nat'l. Academy of Public Administration (Retired) Washington, DC
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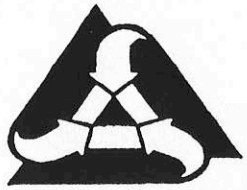
Dr. Stanley I. Weiss *Trustee*	Massachusetts Institute of Technology Cambridge, MA



American Technology Initiative

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